

EXHIBIT “10”

Doc Code: TR.PROV

Document Description: Provisional Cover Sheet (SB16)

PTO/SB/16 (11-08)

Approved for use through 01/31/2014 OMB 0651-0032

U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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Provisional Application for Patent Cover Sheet

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c)

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| | | | | | | |
|---|--------------------|------------------------------|---|-------|-----------|--|
| Inventor 9 | | | | | Remove | |
| Given Name | Middle Name | Family Name | City | State | Country i | |
| David | Christopher Thomas | Laguna | Austin | TX | US | |
| All Inventors Must Be Listed – Additional Inventor Information blocks may be generated within this form by selecting the Add button. | | | | | Add | |
| Title of Invention | | Server Immersion Tank System | | | | |
| Attorney Docket Number (if applicable) | | JMG001-00 | | | | |
| Correspondence Address | | | | | | |
| Direct all correspondence to (select one): | | | | | | |
| <input checked="" type="radio"/> The address corresponding to Customer Number | | | <input type="radio"/> Firm or Individual Name | | | |
| Customer Number | | | 44070 | | | |

| | |
|---|--|
| The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government. | |
| <input checked="" type="radio"/> No. | |
| <input type="radio"/> Yes, the name of the U.S. Government agency and the Government contract number are: | |

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Entity Status

Applicant claims small entity status under 37 CFR 1.27

☒ Yes, applicant qualifies for small entity status under 37 CFR 1.27☐ No**Warning**

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Signature

Please see 37 CFR 1.4(d) for the form of the signature.

| | | | | | |
|------------|---------------------|-----------|-------|---|------------|
| Signature | /Jeffrey Van Myers/ | | | Date (YYYY-MM-DD) | 2012-12-14 |
| First Name | Jeffrey | Last Name | Myers | Registration Number (If appropriate) | 27362 |

This collection of information is required by 37 CFR 1.51. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **This form can only be used when in conjunction with EFS-Web. If this form is mailed to the USPTO, it may cause delays in handling the provisional application.**

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

[0001] Goal: substantially constant pressure at all Spray Heads (at bottom of Tank):

[0002] 1. For example, as in Fig. 1, 13 Spray Bars, each having, e.g., 10 Spray Heads (not shown) each of x-sectional area of 1 unit.

[0003] 1.1. Spray Bars 1 & #13 have x-sectional area of 5 units (Optional: 5 Spray Heads of 1 unit area, or 10 Spray Heads of 0.5 unit area).

[0004] 1.2. Spray Bars #2-#12 have x-sectional area of 10 units.

[0005] 1.3. Total x-sectional area of ALL Spray Bars is 120 units.

[0006] 2. Each (x2) Header Manifold has x-sectional area of 60 units, i.e., 1/2 total x-sectional area of all Spray Bars.

[0007] 3. Total x-sectional area of Supply Manifold is 120 units.

[0008] Result: relative pressure drop at Supply-to-Headers minimal; pressure drop at Header-to-Spray Bar is related to position, but inverse relationship wrt 'top' and 'bottom' Headers compensates (subject to frictional losses, slight differences from ideal x-sectional areas, etc.)

[0009] 1. Each Spray Bar has an area-efficient (e.g, ball, gate) shutoff valve at each end, adjacent the connection to the respective Header, all valves being set at system setup/ change via an actuating rod manually inserted from above; when both closed, no fluid is delivered to the Spray Heads.

[0010] 2. The Spray Bars are spaced such that a Server may be suspended in each inter-Spray Bar gap, thus forming respective 'flow slots' the flow patterns of which project upward from the Spray Heads, through the inter-Server gaps, and, ultimately into open fluid return channel(s) (e.g., weirs) extending horizontally along the long side(s) of the tank.

[0011] 3. Servers are inserted starting from, e.g., the 'left' end of tank, each suspended in a respective 'Server-slot' between adjacent Spray Bars, with no Server-slot vacancies allowed.

[0012] 4. If any empty Server-slots remain, a full tank width/height flow barrier is inserted into the Server-slot immediately to the 'right' of the 'right-most' active

Server, and the shutoff valves at both ends of all 'idle' Spray Bars are closed, thus forming a stagnant fluid reservoir (with proportional system energy savings).

[0013] Operation: Heat developed on the 'left-facing' major surface of Server #1 is extracted by fluid flow developed in flow-slot #1 by Spray Bar #1, while heat developed on the 'right-facing' major surface is extracted by fluid flow developed in flow-slot #2 by Spray Bar #2. Similarly, heat developed on the 'left-facing' major surface of Server #2 is extracted by fluid flow developed in flow-slot #2 by Spray Bar #2, while heat developed on the 'right-facing' major surface is extracted by fluid flow developed in flow-slot #3 by Spray Bar #3; and so on.

[0014] (Optional) The shutoff valves of the Spray Bar servicing the 'right-most' active 'flow slot' (i.e., between the 'right-most' active Server and the flow barrier) may be partially closed to compensate for the reduced heat being radiated/conducted into this flow slot.

[0015] (Optional) Each shutoff valve is controlled by a respective servo, with the valve-pair of each Spray Bar being controlled by a single Valve Controller in response to temperature sensor(s) suspended in the respective flow-slot somewhat below the 'top' surfaces of the adjacent Servers (to more accurately measure the temperature of the fluid exiting the respective flow-slot before significant mixing with fluid flowing in adjacent flow-slots).

[0016] (Optional) A 'smart' Master Controller monitors a selected set of the flow-slot temp sensors, and coordinates the activities of all active flow-slot Valve Controllers. Due to the huge heat storage capacity of the entire fluid mass and concomitant system temperature lag, determining the energy saving contribution of this Master Controller will be problematic, but nonetheless this function contributes to the end goal of protecting the set of active Servers from sustained excessive heat excursions.

[0017] (Option) The gaps between the 'side' surfaces of each Server and the adjacent side(s) of the Tank may be blocked using appropriately sized flow baffles to facilitate more precise control of fluid flow in each flow-slot.

[0018] (Option) As in Fig. 2, dispose infra-red (IR) shields between adjacent blades to reflect/absorb IR radiation from one blade to the next adjacent blade.

Reflection can be achieved using highly polished metal/ mirrored plates, e.g., gold-plated; absorption can be achieved using flat-black or black-anodized plates. Fins can be added to enhance effectiveness. Multiple layers may also be employed with an interlayer gap for vertical flow of the cooling fluid.

[0019] (Option) Also as in Fig. 2, orient the Spray Bar(s) longitudinally with Spray Head(s) aligned with inter-blade gaps. If more than one Spray Head per gap, arrange radially so as that the flow pattern resembles a fan, as in Fig. 3. Individual Spray Heads can be fan-shaped. Spray Heads can be fixed flow rate or variable flow rate or a mixture of both as required for specific applications. Variable flow rate can be adjusted manually or by servo-mechanism.

[0020] (Option) Also as shown in Fig. 3, Supplementary Spray Bars, oriented vertically but with horizontally-oriented 'aimable' Spray Head(s), can be provided to provide flow of cooling fluid directly onto local blade hotspots. Such Supplementary Spray Bars can be supplied either from the primary Spray Bars or via special Supplementary Manifolds disposed either at the bottom/ top of the tank or adjacent the tank side(s).

[0021] (Option) Dispose within the tank a bladder to contain the fluid and all related structures. This allows the tank to be modular, bolt-together panels as the fluid sealing is accomplished via the bladder. Over time, as necessary, the bladder can be drained and replaced without any special expense or effort to clean the inside surfaces of the tank. Based on heuristic evaluation, the shape of the tank can be optimized to minimize hot spots, e.g., form a narrow "waist" in the long side walls to develop a Venturi-like region wherein fluid flow is accelerated past a specific horizontal zone of the blades.

[0022] (Option) Spray Head design can be selected to match heat signature of each blade. Spray Heads can be fixed flow rate or variable flow rate or a mixture of both as required for specific applications. Spray Heads can be mounted on short flex-tubes to provide directional distribution for augmented cooling. In some applications, selected Spray Bars/Heads can be supplied from an auxiliary cooling source operating independently of the main fluid source.

[0023] (Option) Attach a solid-state temperature sensor on or adjacent to each Supplemental Spray Head to provide closed-loop control of a servo-controlled valves supplying such Spray Head.

[0024] (Option) Provide servo-mechanical arrangement to dynamically reposition each Supplemental Spray Head. Attach an RFID tag on each Supplemental Spray Head to provide closed-loop control of the repositioning system.

[0025] (Option) Provide array of temperature sensors together with RFID tags on the Supplemental Spray Heads to allow software monitoring of local hot spots, with automatic repositioning of nearby Supplemental Spray Heads to detected hot spots. Same system can provide servo-control of Spray Head supply valves to resolve larger scale heat zone problems.

[0026] (Option) In addition to, or as a supplement to, the static weir fluid return system, provide active fluid extraction. To prevent loss of suction, provide fluid level sensor(s) to reduce or shut off active extraction before the fluid level drops below the suction point.

[0027] (Option) Design blades specifically for fluid immersion, e.g., with no enclosure, no fans. Orient component heatsinks so as to maximize heat transfer to the cooling fluid while minimizing vertical fluid flow resistance/turbulence. Relocate *essential* moving components, e.g., rotating disk devices, from blades to locations adjacent the respective blade but outside the cooling fluid. For multi-server blades (or blades with more than one significant local heat generating component), distribute the major heat generating components vertically/horizontally to spread the heat signature more evenly vertically/horizontally across the entire surface of the blade. When feasible, mount components on both sides of the blade to facilitate heat distribution to the fluid flow on both sides of the blade.

[0028] The cooling system can be any of several known types: vapor compression; water evaporative ("swamp cooler"); dessicant; ground water source; ambient air source, etc. Choice will be based on geographic location,

availability of energy resources, installation/operating costs, etc. Automatic switch-over to alternative systems can be provided to minimize operating cost.

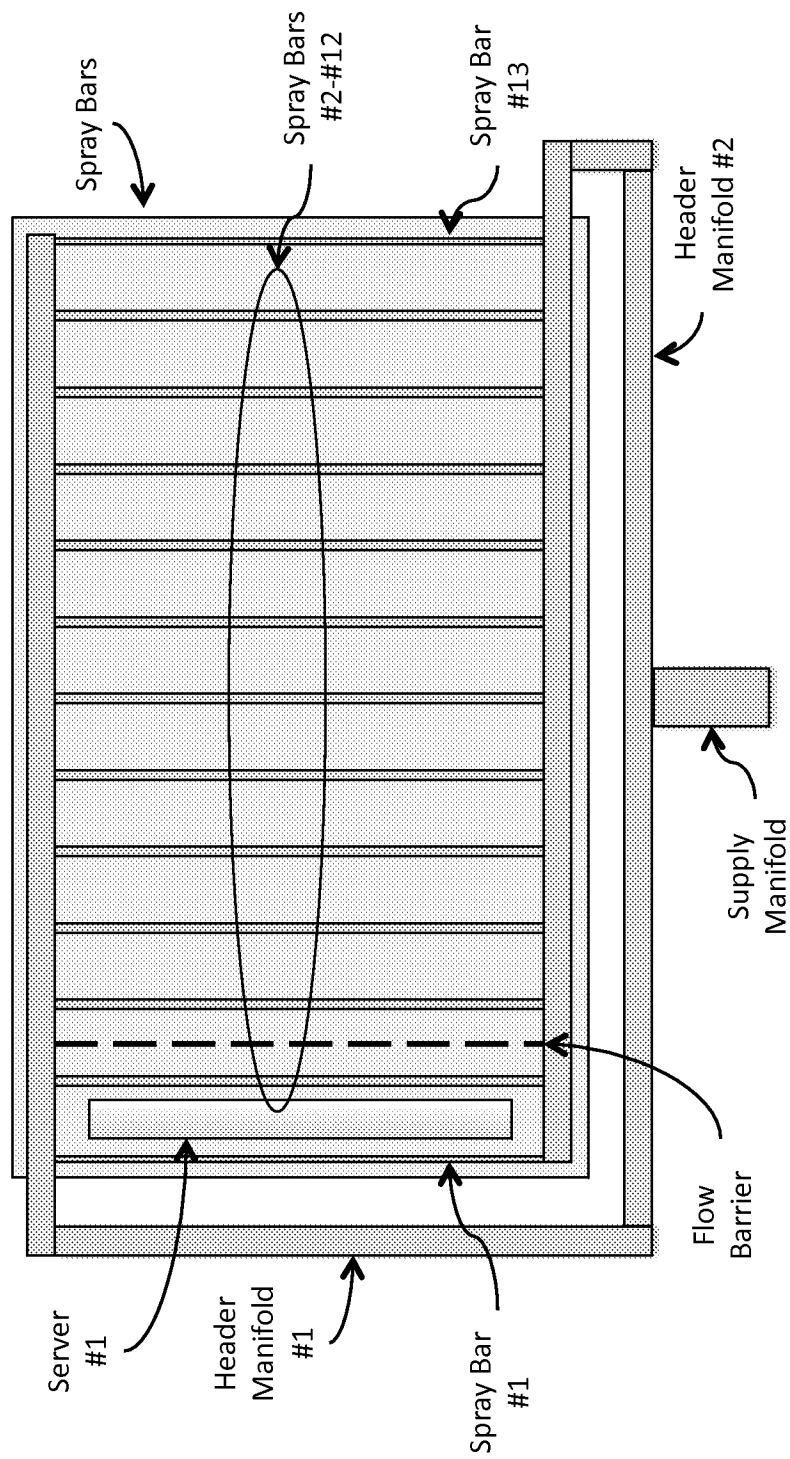
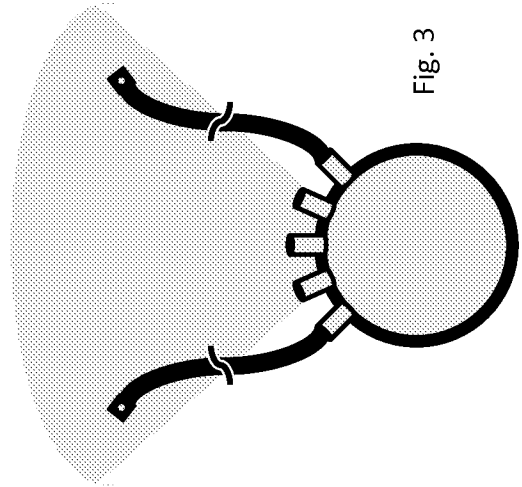
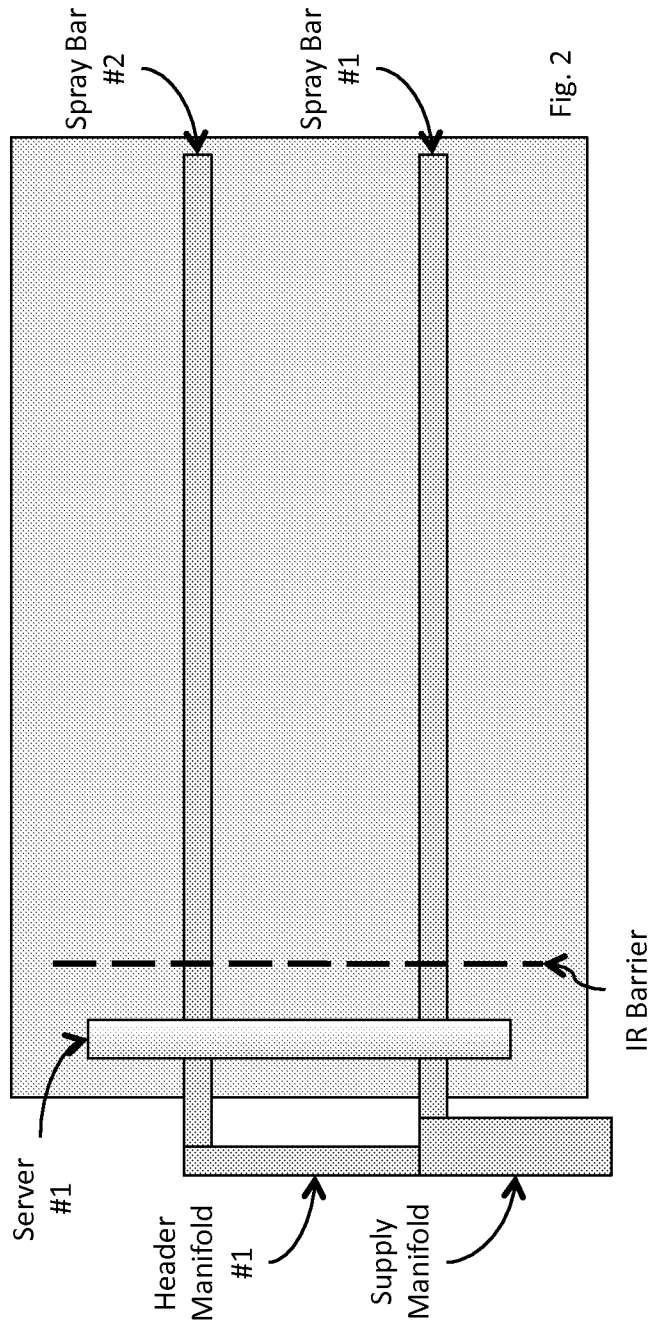


Fig. 1

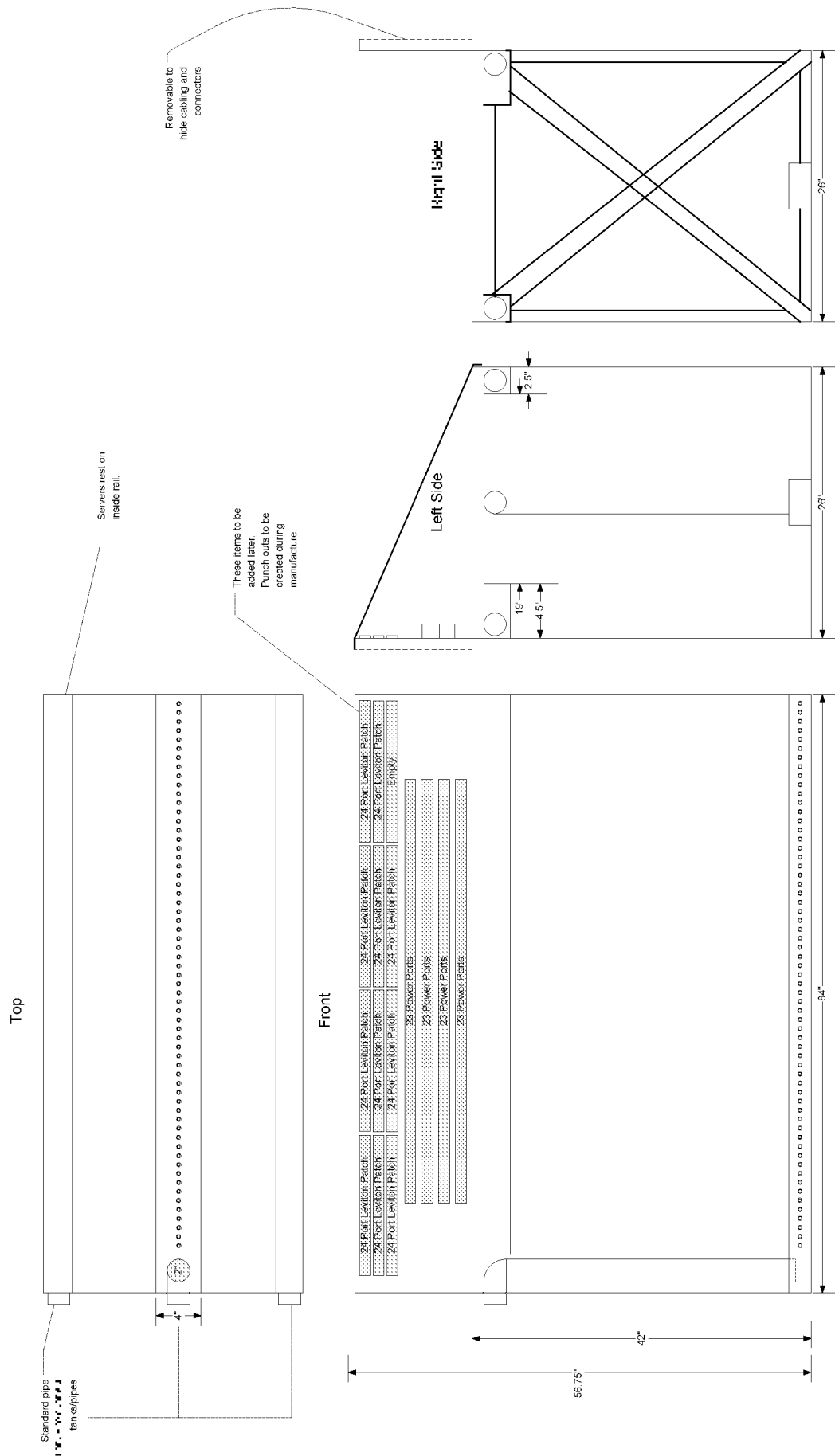


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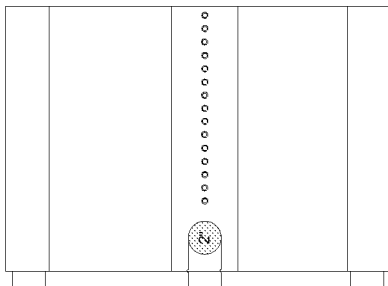
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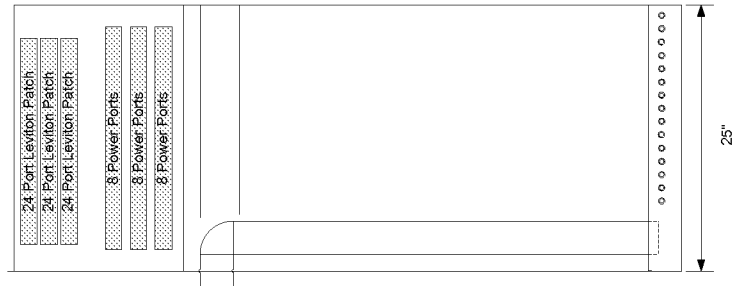
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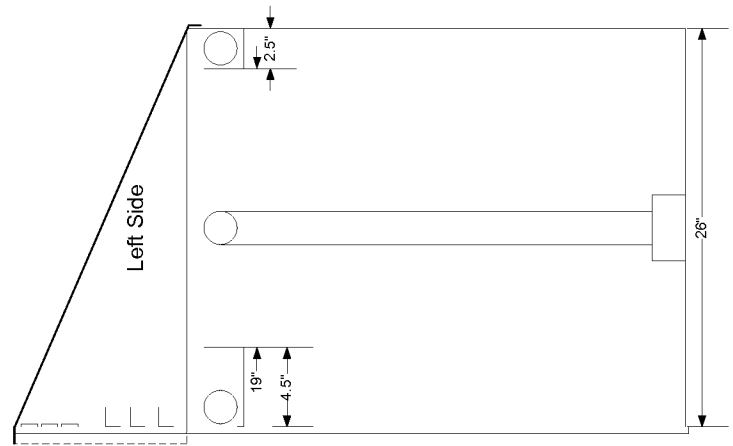
Top



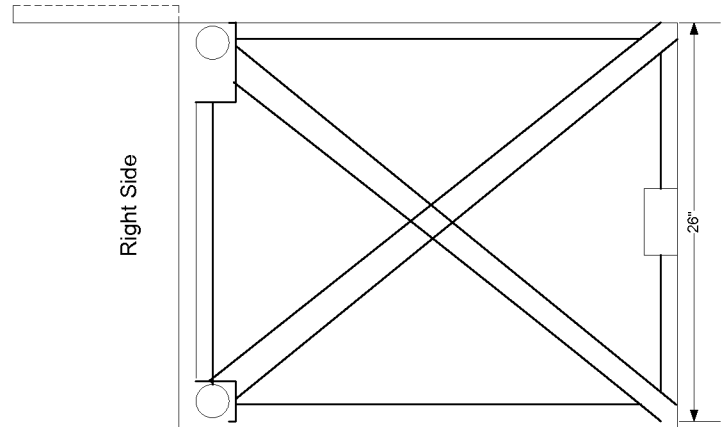
Front

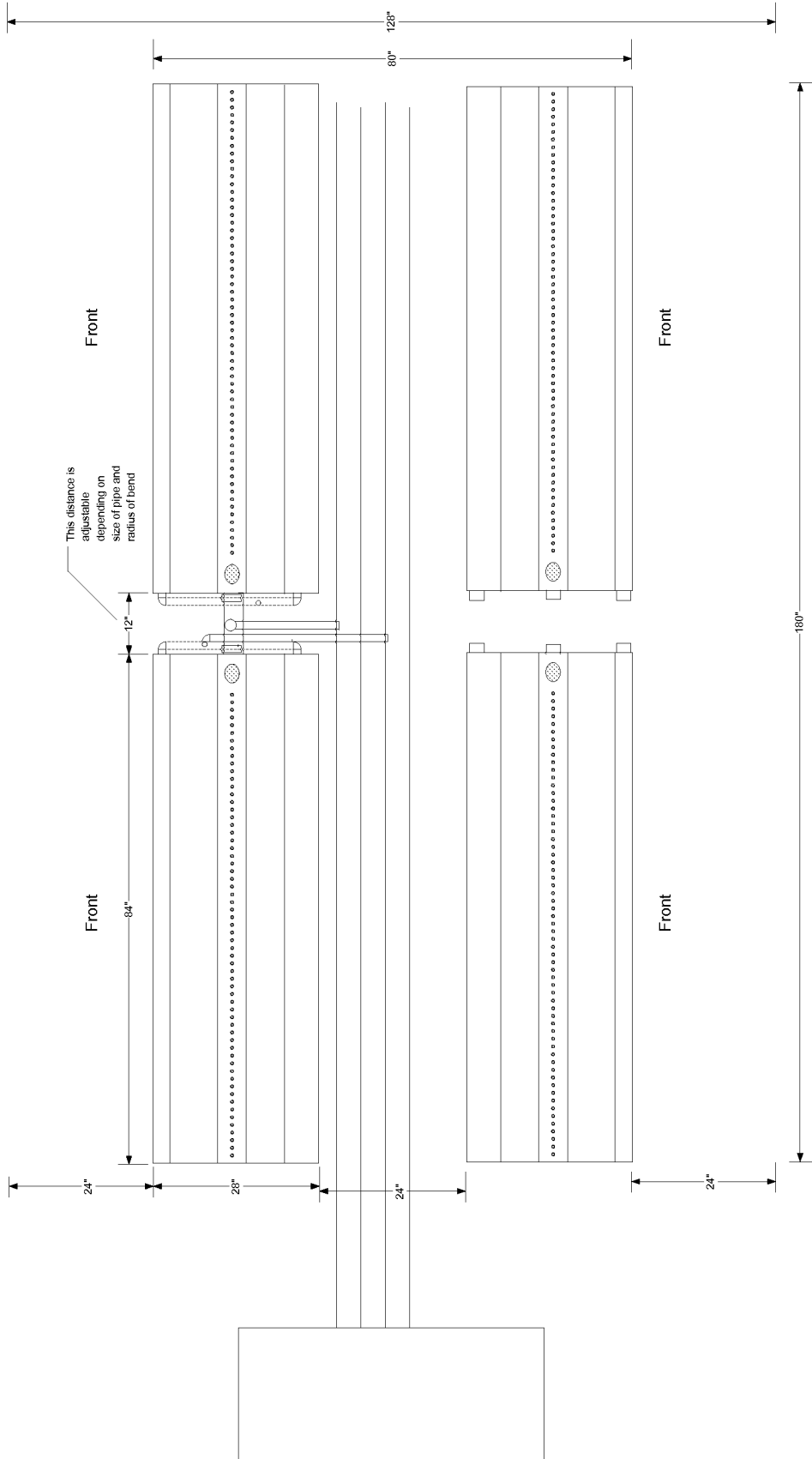


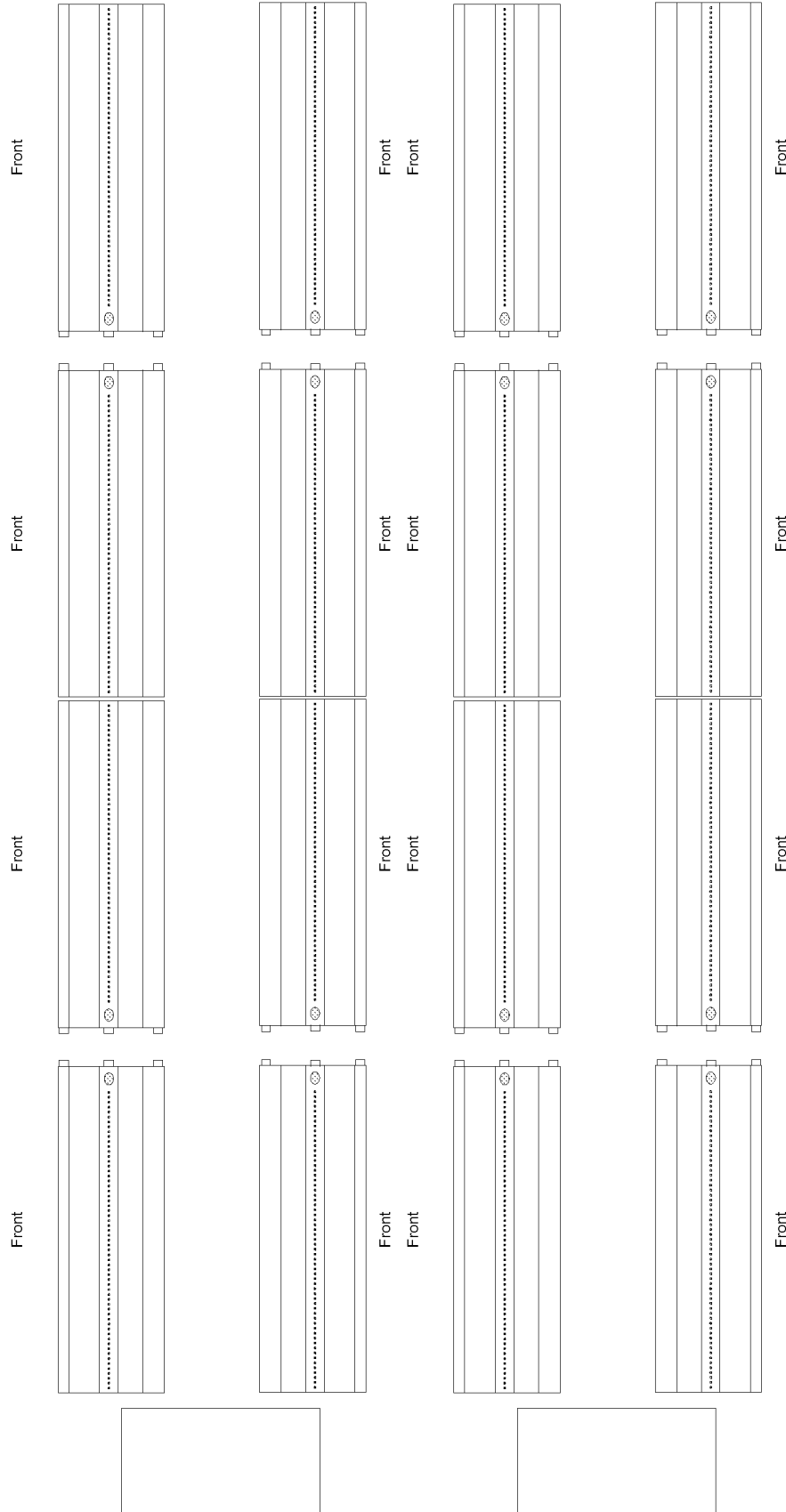
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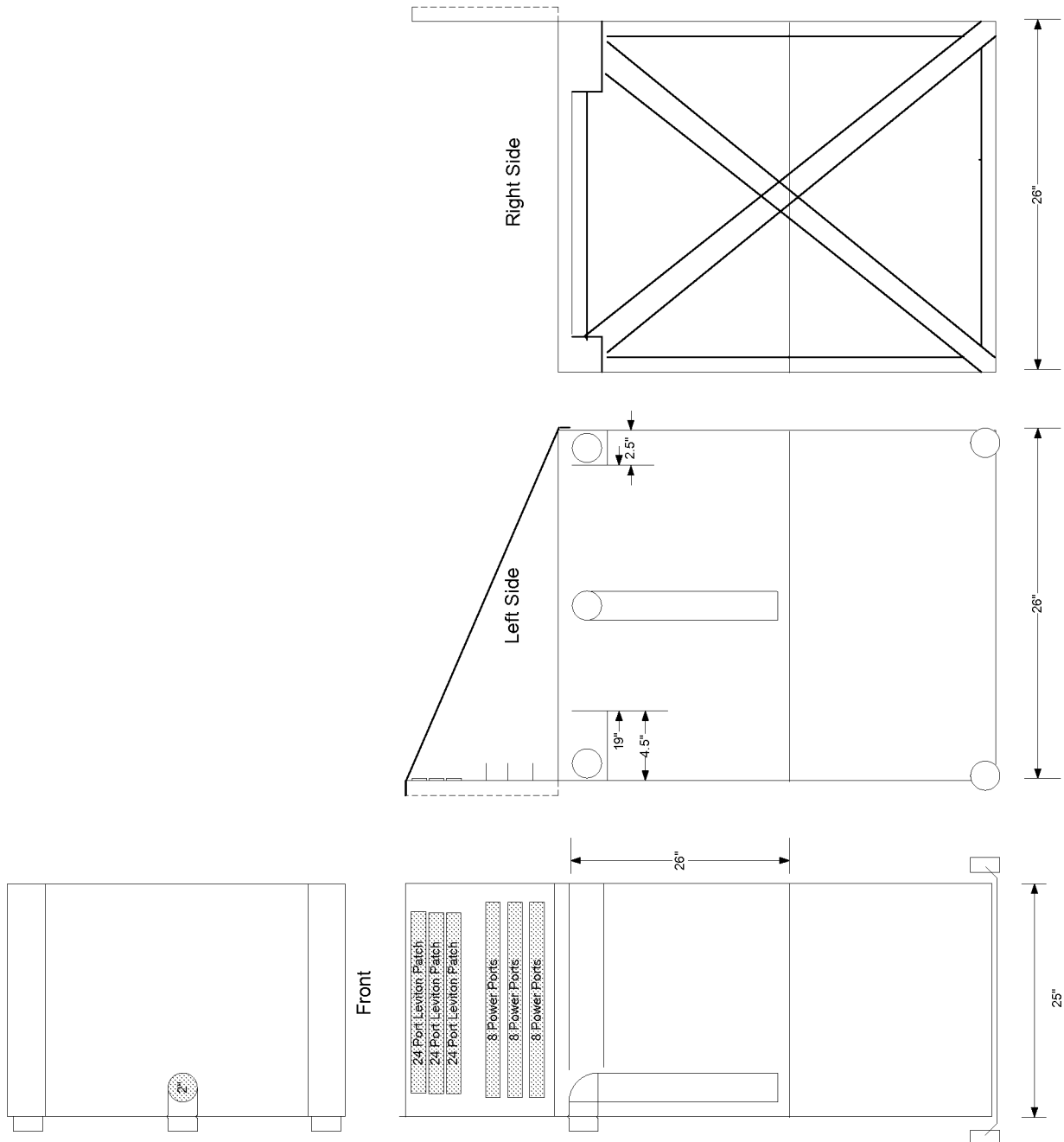


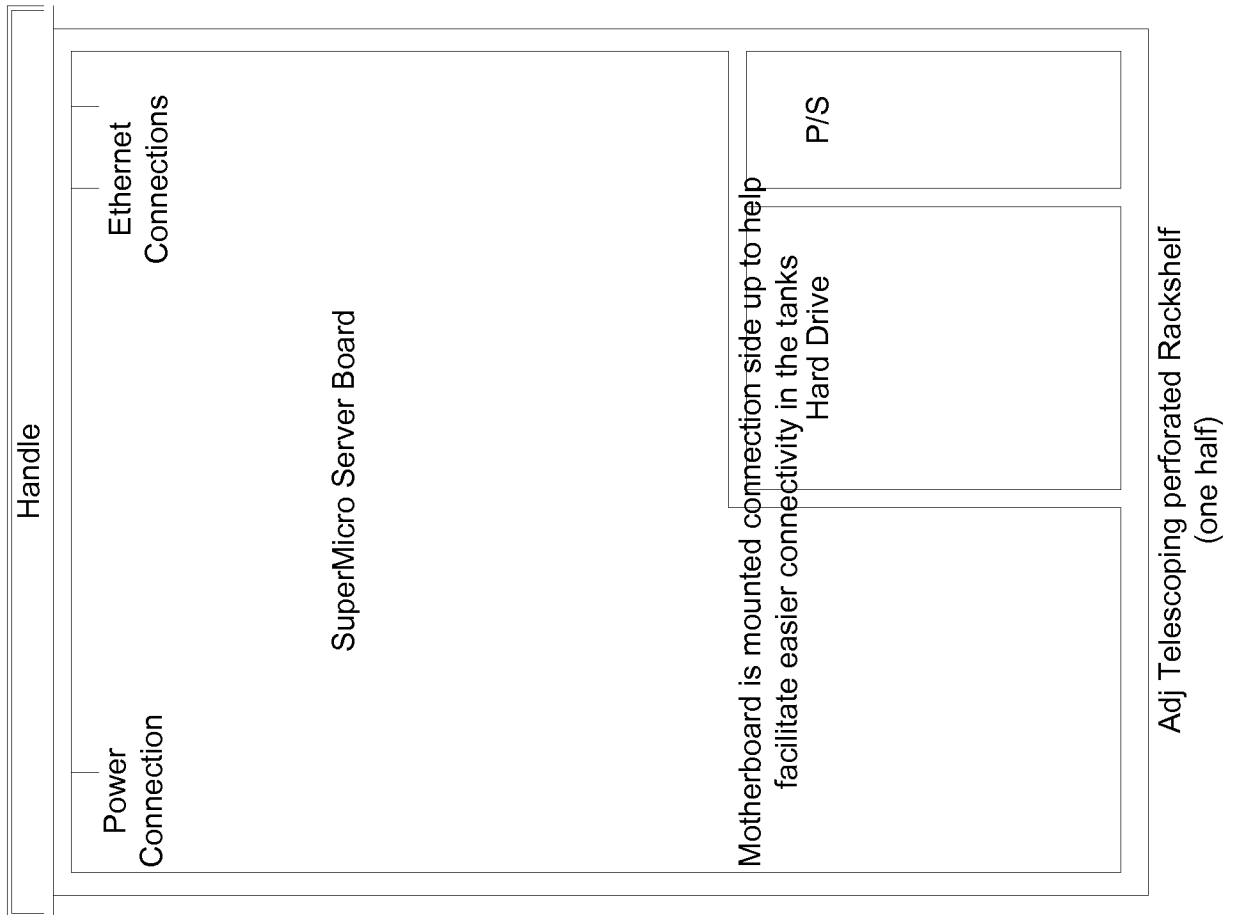
Right Side







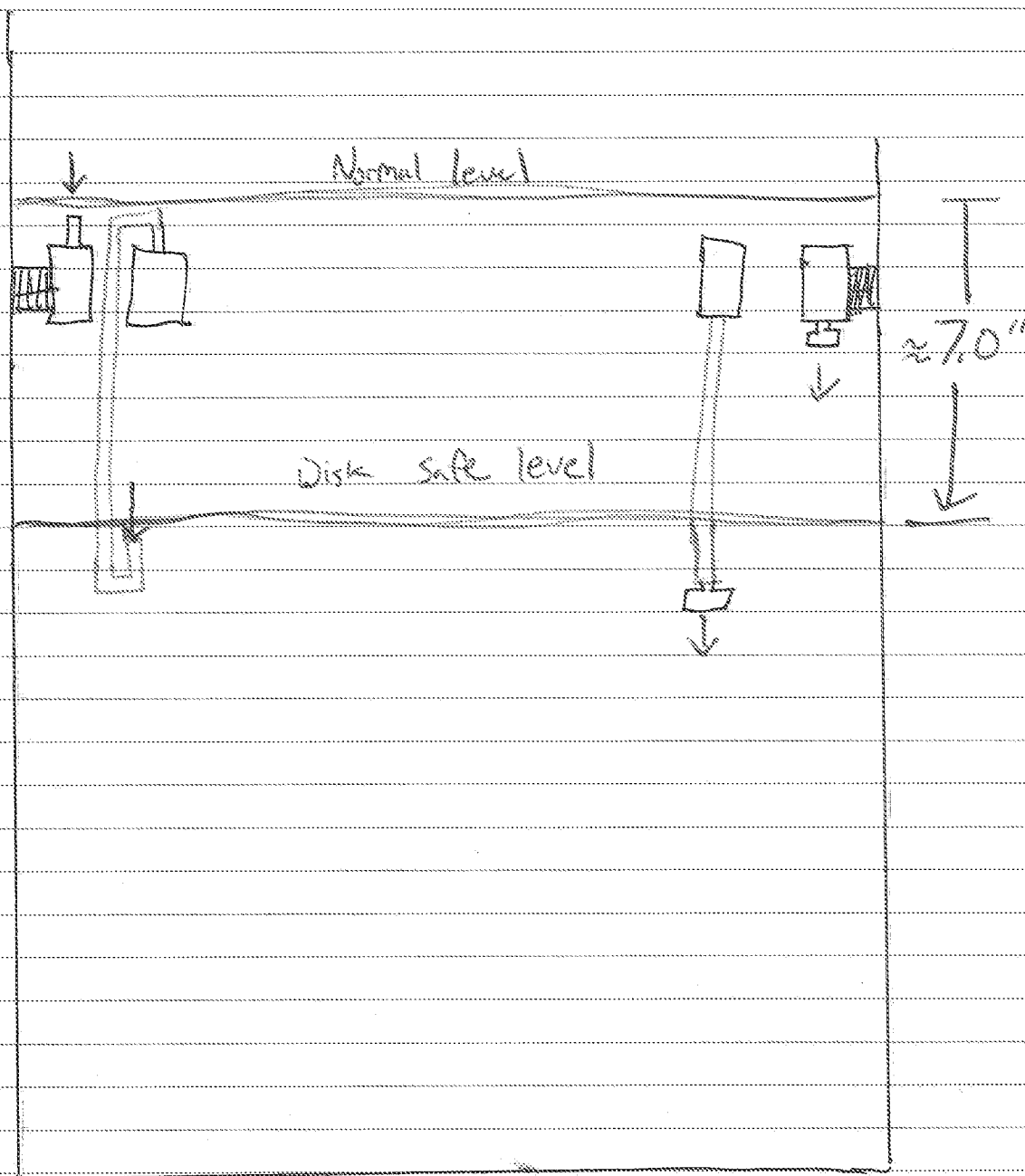




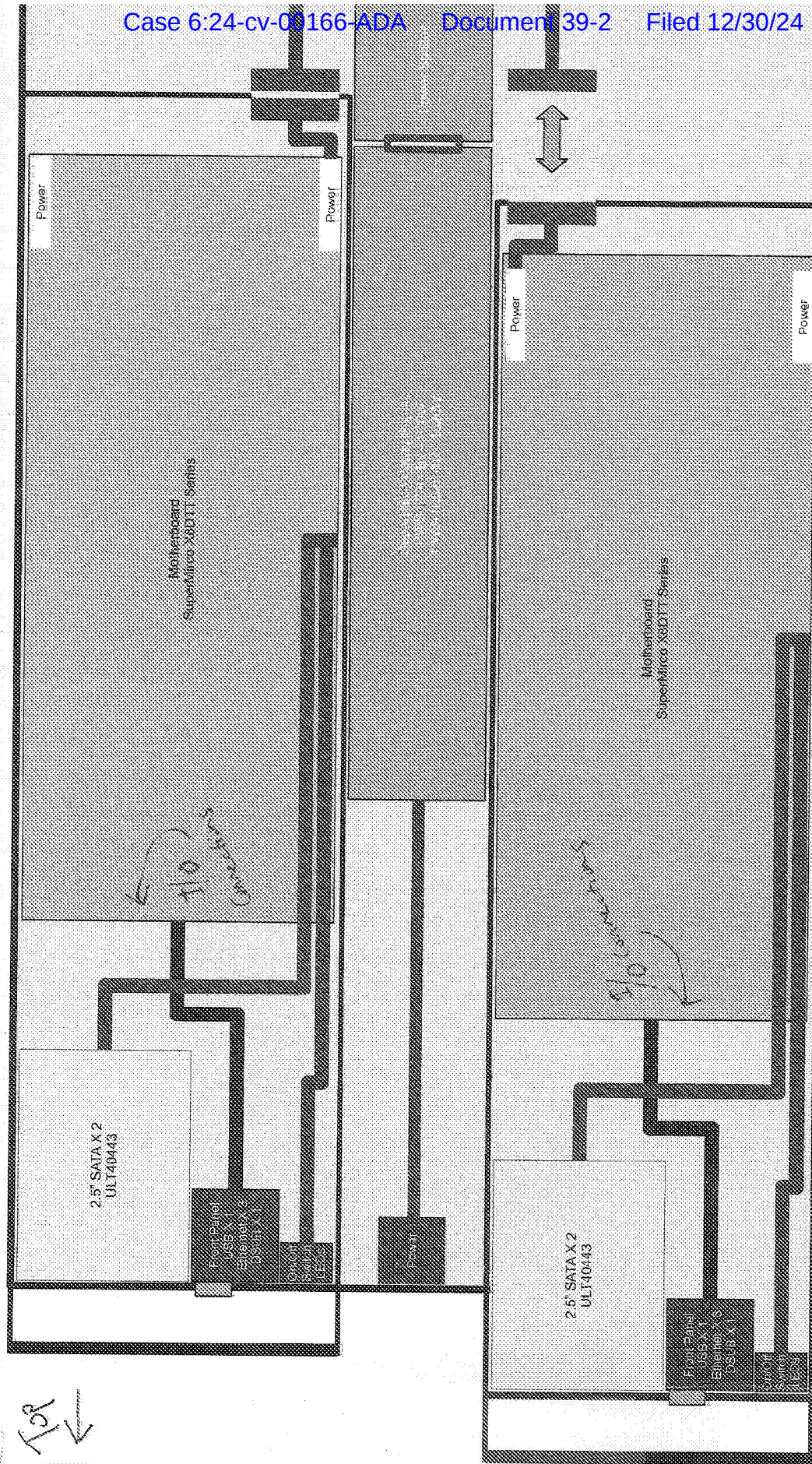
Dropped Oil level for sensors w/ unsealed disks.

Oil is about 7" lower and nozzles are lowered on threaded tube to sit a few inches below the oil level.

Intake is extended via tube/pipe to sit just below oil level with intake pointing up.



Midas Green Tech - 1U Low Energy High Density Rack (LEHDR)



LEHDR 1U Style 1

Support for: (2) 16.7" x 7.0" Motherboard*, (1) 20.0" x 3.0" x 1.65" Power Supply
(4) 2.5" Hard Drives

* = Maximum component dimensions

Overall Dimensions: 17.5" x 30" x 1.75"

Slid (Node) Dimensions: (without handle) 7.5" x 21.75" x 1.7"

Chris Laguna - Midas Green Tech - July 2012



performed along bottom for oil flow

Reviewed & Understood by me,

Date

Invented by

Date

Recorded by

Chris Laguna

11-15-12

D. Chris Laguna

8/6/2011

SLED Assembly

SLED = Super Low Energy Device, Midas Green Tech's oil-ready and optimized server.

All steps should be done utilizing an ESD safe environment with the proper tools.

Planning

- Determine type of SLED from customer order details
- Single Server
 - Dual Server
 - Triple Server
 - Quad Server
 - Other
- Determine Form Factor
 - 1U
 - 2U
 - 3U
 - 4U
 - Other
- Establish Server(s) Specifications
- Select Processor(s)
 - Select Motherboard(s)
 - Select Power Supply(s)
 - Select Heat Sink(s)
 - Select Memory Configuration
 - Select Disk Configuration
 - Select Peripherals
 - Select Chassis
 - Select necessary cables, adapters, I/O ports, brackets, mounts, screws and materials
- Verify and Finalize SLED Layout
- Use component templates to plan layout with I/O ports facing the front (top) of the SLED
- Verify tolerances are in place for cabling and assembly
- Confirm component compatibility
- Finalize layout
- Order/Obtain Parts

Fabrication

- Clean and inspect chassis for defects
- Remove any unnecessary chassis components (fans, mounts, etc.)
- Use component templates to mark necessary modifications to chassis. Modifications can be the addition of mounting points, removal of chassis components, additional ventilation holes and brackets to secure server components
- Modify chassis for server components

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- Remove any sharp corners or edges
- Clean and ensure modified chassis is clean and dry
- Verify chassis modifications with server component templates
- Dry-fit server components to verify clearances and tolerances

Assembly

- Install motherboard mounts and motherboard verifying proper mount alignment and making note of cable connection points
- Remove motherboard and return to protective sleeve
- Install power supply and power distribution (if applicable) components
- Make note of routing of power cabling, make every attempt to conceal power cables under motherboard mounts
- Install storage components, and run necessary cabling
- Install I/O cabling, including power switches, LED indicators, LAN, video and USB connections if necessary
- Before installing in chassis, install the processor and heat sink into the motherboard using indium foil instead of thermal grease. Any motherboard or peripheral components with a removable heat sink will need any thermal greases, compounds or tape removed and surfaces cleaned
- Mount motherboard on mounts and secure with the proper screws taking caution to the cabling being ran below the motherboard
- Connect all cabling
- Double check clearances and fit of components
- Install memory and any peripherals, including hard drives
- Clean up cabling and secure any loose cables and connections
- Finalize chassis assembly with mounting brackets and handles

Initial Testing

- Temporarily install fans on all processors
- Double check all cables are properly installed and secure, all components are installed and secured
- Connect monitor, keyboard and USB/CD/DVD-ROM containing testing software
- Connect power and power on the server
- Verify in server BIOS that all peripherals are recognized and working

If server does not power on, utilize the motherboard manual for troubleshooting

- Run memtest for at least 5 minutes to do a quick check of the installed memory
- Connect Ethernet
- Install OS of choice to verify proper server functionality including RAID's, Networking, etc.

Burn-in and Stress Testing

- Only begin burn-in once testing is complete and you are satisfied with the function of the server
- With the server still out of the oil and fans installed continue:
- Boot from stress-test CD (stresslinux.org or similar)
- Run stress utilities at 50% utilization for at least 2 hours. Run at 100% utilization for 2 more
- Verify server passes stress test by analyzing software logs and reports

If a component fails, isolate the component, remove it and replace it, repeat the testing above

- Finalize server prep for oil submersion, removing fans and finishing chassis assembly
- Lift server so that it is oriented vertically as it will be installed in the tanks, check for loose components
- Submerge server in testing tank
- Restart the stress test and allow it to run at 50% utilization for another 2 hours, 100% utilization for at least 2 hours and time permitting, overnight at 50% utilization
- Analyze for failures and replace any failed components

Release to production

- Remove any testing equipment and media
- Format hard drives and run a DOD wipe to clear any stored data.
- Install OS and setup as indicated in order details

-
- internal/procedures/sled_assembly.txt · Last modified: 2012/10/24 12:37 by laguna
 -

IMPROVED SLED PACKAGE
 Title _____ Book No. _____
 Page No. _____

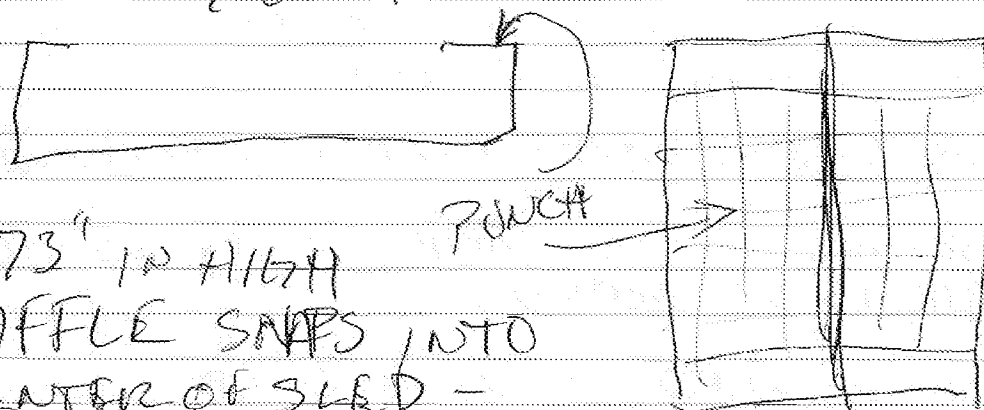
ISSUES WITH CURRENT SLED —

- LONG ASSEMBLY TIME
- NO PROTECTION AGAINST SHORTS WHILE INSERTING OR REMOVING SYSTEMS FROM TANK
- POSSIBLE POOR COOLANT FLOW DUE TO OPEN DESIGN

NEW SLED BASE

USE STAMPED STEEL FOR BOTTOM —
 PUNCH 5MM X 5MM (MAYBE SMALLER) ROUND HOLES IN A MATRIX ON BOTTOM — ALLOWS USE OF STAB-LOCKING NYLON MOUNTS FOR PC BOARDS

SIDES OF SLED COME UP 1.75" FOLD OVER —
 PUNCHED 1 ROW ON FOLD OVER FOR SNAP MOUNTING OF TOP



1.73" IN HIGH
 BAFFLE SNAPS INTO
 CENTER OF SLED —
 PREVENTS COOLANT MIXING
 BETWEEN BOARDS ON SLED

SLED TOP IS MOLDED PLASTIC SHEET WITH
 SMALL POSTS ON EDGE TO INTERLOCK WITH SLED
 BASE EDGE. ALSO INCLUDES MOUNTPONTS FOR
 SEVERAL SMALL PUSHBUTTON SWITCHES (POWER,
 RESET, ETC).

Invented & Understood by me,

Chris Boyd

Date

3-14-12

Invented by:

CHRIS BOYD

Recorded by:

CHRIS BOYD

Date

3-12-2012

To Page No. 2

Project No. _____

Book No. _____

TITLE IMPROVED SLED PACKAGE

Page No. 1

ASSEMBLY —

- 1) TECH PRINTS OUT MOUNTING TEMPLATE FOR MOTHERBOARD AND ALIGNS THEM IN UPPER RIGHT & LEFT OF SLED BASE.
- 2) TECH PUSHES STAB-LOCK POSTS INTO SLED BASE AT POINTS NOTED ON TEMPLATE
- 3) TECH INSTALLS CPU, RAM, HEATSINKS, INDIUM FOIL, ETC TO PREP BOARD FOR IMMERSION SERVICE
- 4) TECH PLACES MOTHERBOARD OVER TOP OF STAB-LOCK POSTS & PUSHES INTO PLACE
- 5) TECH INSTALLS BAFFLE - BAFFLE HAS MOLDED IN STAB-LOCKS AND CABLE CLIPS/TIE POINTS
- 6) TECH SNAPS BOOT DRIVE INTO MOLDED CARRIER WITH STABLOCKS - SNAPS INTO SLED
- 7) TECH MOUNTS PSU ONTO SLED W STAB-LOCKING BRACKETS
- 8) TECH CONNECTS POWER, DISK, POWER SWITCH, RESET SWITCH CABLES TO BOARD
- 9) TECH SNAPS SLED TOP ONTO SLED
- 10) ASSEMBLY COMPLETE, READY FOR TEST/BURN IN.

To Page No. X

Inspected & Understood by me:

Date

Invented by:

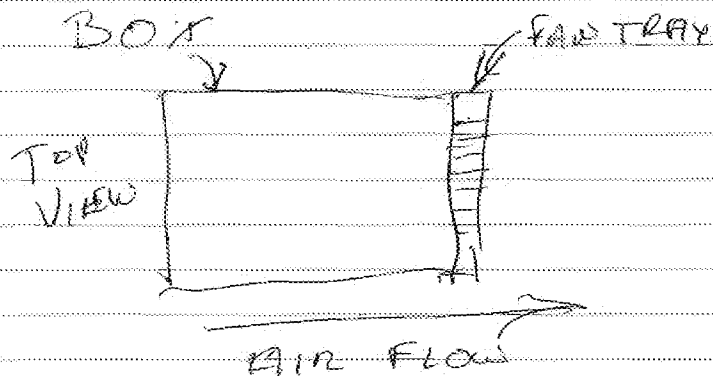
Date

Recorded by:

3-14-12

TITLE COOLING SYSTEM FOR IMPROVED SLEDS Subject No. _____
 From Page No. X Book No. _____

MANUFACTURERS OF MOTHERBOARDS, SERVERS, ETC. ARE CURRENTLY RELUCTANT TO WARRANTY BOARDS IMMersed IN MINERAL OIL. TO MINIMIZE OUR RISK DUE TO "INFANT MORTALITY," WE CAN BURN IN + TEST SYSTEMS DESTINED FOR IMMERSION IN AIR -

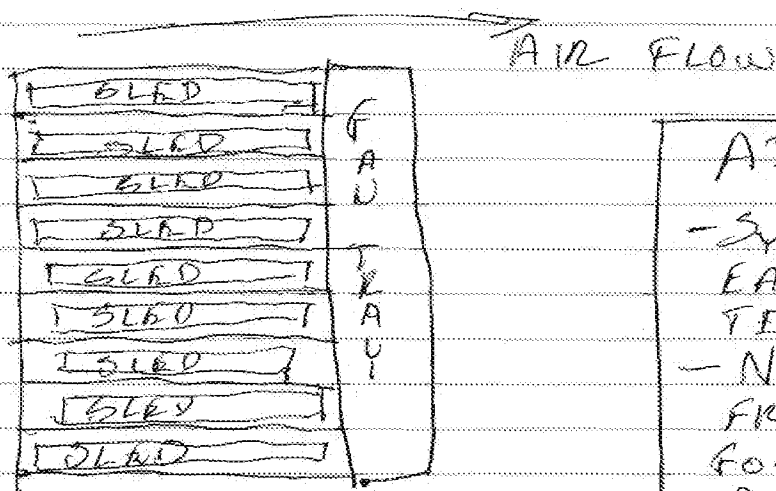


SLIDE FAN TRAY INTO BOX.

TURN ON FAN TRAY TO PULL AIR THROUGH BOX, OVER BOARDS & OTHER COMPONENTS

RUN BURN-IN TESTS.

MULTIPLE BOARDS/SLEDS CAN BE TESTED @ SAME TIME



SOLID BARRIERS SIDES, TOP, BOTTOM TO FORCE COOLING AIR OVER BOARDS UNDER TEST

ADVANTAGES -

- SYSTEMS UNDER TEST NOT EASILY ACCESSED & HANDLED TECHS
- NO "VOIDED WARRANTY" EXCEPT FROM BOARD MANUFACTURER FOR EARLY FAILURES
- ALLOWS US TO USE A VME FOR SYSTEM ASSEMBLY
- NO OILY PARTS SHIPPED TO US TRIGGERING SECURITY INSPECTIONS OF PACKAGE

Witnessed & Understood by me,

Jan R Kan

Date

3-14-12

Invented by:

CHAS BOTO

Recorded by:

CHAS BOTO

Date

3-12-2012

To Page No. _____

Project No. _____

Book No. _____

TITLE GREEN NOTES

From Page No. X

3-12-2012 STORE RAIN WATER RUNOFF FOR USE IN COOLING TOWERS
3-13-2012 DEPLOY ALL SYSTEMS @ 208/240V 2-3% POWER SAVING FOR FREE

Witnessed & Understood by me,



Date

3-14-12

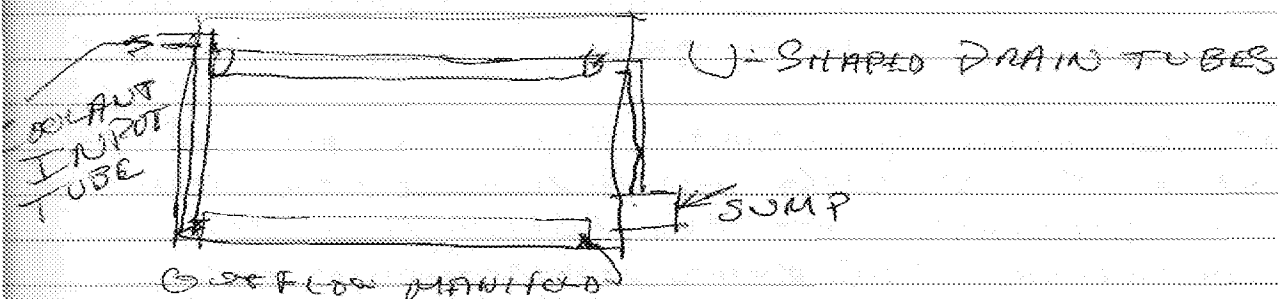
Invented by:

Recorded by:

Date

To Page No. _____

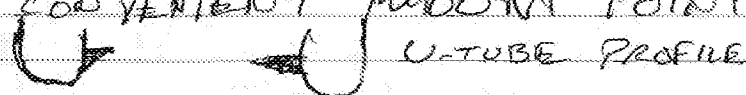
Project No. _____
Book No. _____
Page No. 5



GOAL - IMPROVE FORCED CONVECTION COOLING EFFICIENCY BY AVOIDING MIXING OF COOLANT.

COLD FLUID FLOWS INTO TANK VIA TUBE CONNECTED TO A SLOTTED MANIFOLD. COLD FLUID DISPLACES WARM FLUID FROM BELOW. WARM FLUID OVERFLOWS U-SHAPED DRAINS ON BOTH SIDES OF TANK WALL.

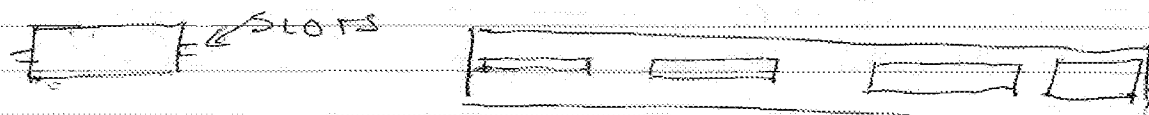
(NOTE - A SPINE ON THE SIDE OF THE U-TUBE COULD ACT AS A CONVENIENT MOUNT POINT FOR SERVER EARS.)



U-TUBE PROFILE

U-TUBES DRAIN INTO A CLOSED SUMP CONTAINER FOR RECIRCULATION THRU HEAT EXCHANGER. NOTE THAT THE PUMP CANNOT DRAIN THE TANK.

POSSIBLE SLOTTED OUTFLOW MANIFOLD PROFILE -



I SUSPECT SLOTS WOULD NEED TO BE NARROW ON THE END CLOSEST TO THE POINT WHERE COOLANT IS INJECTED, AND GET PROGRESSIVELY WIDER TO ~~BE~~ ACCOUNT FOR PRESSURE CREATING LAYER AS COOLANT FLOWS DOWN THE TUBE.

- COULD ALSO USE A SERIES OF PROGRESSIVELY LARGER ROUND HOLES.

Inspected & Understood by me,

[Signature]

Date

3-14-12

Invented by:

Chris Boyd

Recorded by:

Chris Boyd

To Page No. _____

Date

3-2-2012

6

Project No. _____

Book No. _____

From Page No. XTITLE METHOD FOR AUTHENTICATINGGRAPHICS SERVED BY A WE
OTHER SERVER TO PREVENT
PHISHING, TRADEMARK ABUS

- EXTEND CURRENT STANDARD OPEN FORMATS LIKE
JPEG, JPEG2000, OR PNG TO INCLUDE META DATA
ABOUT THE SERVER(S) THAT ARE AUTHORIZED TO
SERVE THE GRAPHIC. THIS COULD INCLUDE, BUT IS NOT
LIMITED TO:

IP SUBNET OR ADDRESS

PTR RECORD

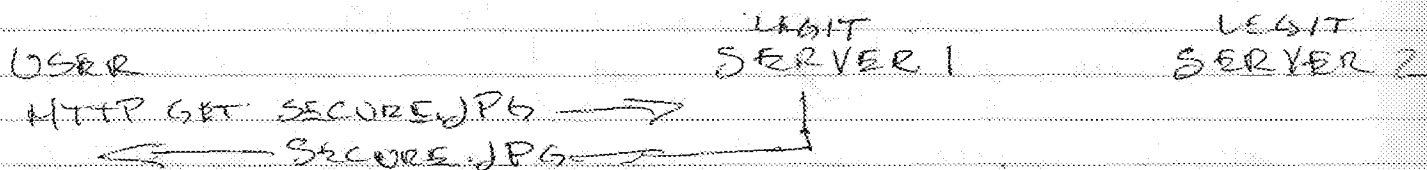
REFERRING URL

REFERRING DOMAIN NAME

HTTPS URL WITH GRAPHIC OWNER'S PUBLIC KEY

THIS DATA IS COMPRESSED & CRYPTO SIGNED WITH THE GRAPHIC
OWNER'S ~~PRIVATE~~ PRIVATE KEY.

NORMAL TRANSACTION WORKS SOMETHING LIKE THIS



DECOMPRESS META DATA &

GET KEY URL

HTTPS GET KEY-PUB.PEM

KEY-PUB.PEM

SSL CERTS MATCH

META DATA MATCH

DISPLAY GRAPHIC

Witnessed & Understood by me,

Date

11-15-12

Invented by:

CHRIS BOYO

Recorded by:

CHRIS BOYO

Date

6-6-2012

To Page No.

TITLE

Page No. 6

THIS SCHEME HELPS PREVENT THINGS LIKE PHISHING —

USER PHISH SERVER LEGIT SERVER 2

HTTP GET STOLEN.JPG →
← STOLEN.JPG ←

DECRYPT META DATA GET
KEY URL

HTTPS GET KEY-PUB.PEM →
← KEY-PUB.PEM ←

META DATA MISMATCH! ALERT USER TO PROBABLE PHISH!

FOR BEST SECURITY, KEY URL SHOULD BE ON A
DNSSEC SIGNED DOMAIN NAME.

NEEDS WIDE SUPPORT IN BROWSERS, EMAIL CLIENTS
GRAPHICS ARTS PACKAGES, ETC.

POSSIBLE EXTENSION? DEVELOP A WAY FOR A DOMAIN
NAME TO SIGNAL THEY ALWAYS USE THIS SCHEME —
MAYBE AN ADDITIONAL TXT RECORD IN DNS?

Expressed & Understood by me,

Date

Invented by:

To Page No. 35

Recorded by:

Date

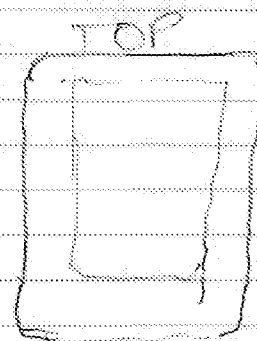
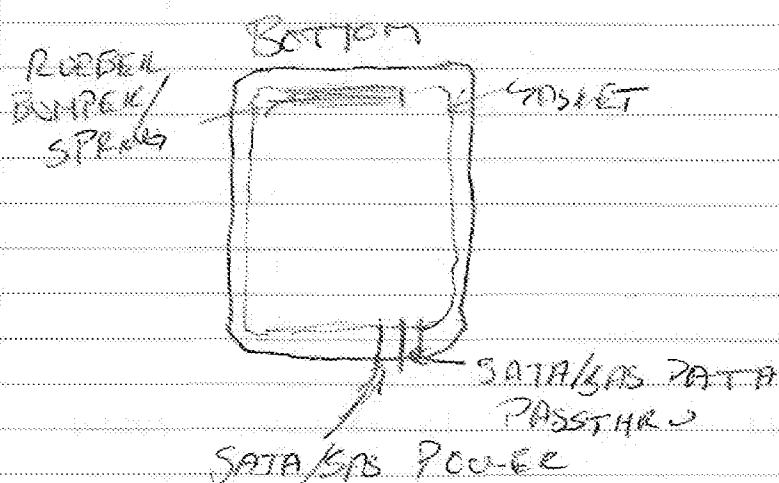
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Project No. _____

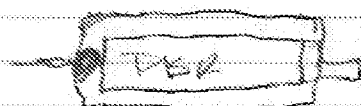
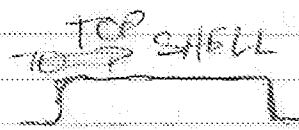
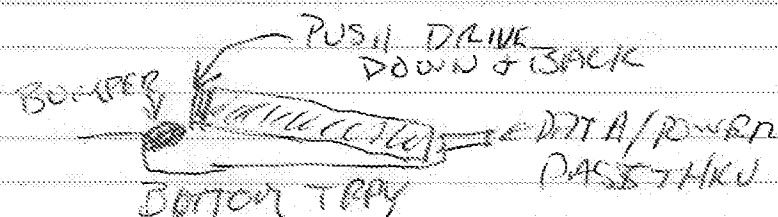
Book No. _____

TITLE DISK DRIVE PACKAGING FOR ARRAY
IMMERSIONFrom Page No. X

STAMPED ALUMINUM ENCLOSURE - CLAMSHELLS TOGETHER
TO SEAL DISK DRIVE - WITH OIL RESISTANT GASKET.

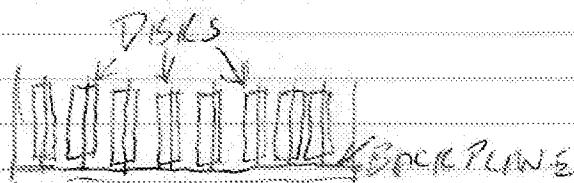


DISK DRIVE SNAPS INTO PLACE & IS SECURED
BY DATA/POWER CONNECTORS & RUBBER BUMPER

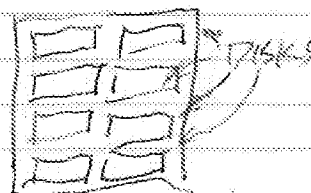


ASSEMBLED CASE

ASSEMBLED DISK CASES CAN BE MOUNTED EASILY IN A DISK ARRAY
CABINET SIMILAR TO A BACK BLAZE OR COMPILMENT.



SIDE VIEW



TOP VIEW

Witnessed & Understood by me,

[Signature]
4-15-17
2012

Invented by:

Chris Boyd

Recorded by:

Chris Boyd

Date

4-15-17
2012

To Page No. 9

TITLE DISC DRIVE PACKAGING FOR ARRAY

Project No. _____

Book No. _____

From Page No. 8

IMMERSION

EDGES OF DRIVE CASE ARE USED AS MOUNTING RAIL GUIDES TO HOLD DRIVE IN THE ARRAY.

CABINETS CAN BE LIFTED OUT PART WAY FOR DRIVE REPLACEMENT OR MAINTENANCE, LEAVING CONTROLLER SUBMERGED FOR COOLING.

CAN BE RETROFITTED TO BACK BLAZE CABINET.

Witnessed & Understood by me,

Date

Invented by:

Date

To Page No. _____

11-15-12

Recorded by:

CARL S BOYD

CARL S BOYD

3-21-2012

10

Project No. _____

Book No. _____

TITLE IR SENSING FOR TANKFrom Page No. X

USE MULTIPLE IR SENSORS, POSSIBLY WITH WIDE ANGLE LENSES INSIDE TANK TO MONITOR COOLANT CIRCULATION TEMPERATURE - OR, USE A DIGITAL IMAGING SENSOR - POSSIBLY JUST A MODIFIED DIGITAL CAMERA SENSOR - WITH IMAGE PROCESSING SOFTWARE TO DETECT & COMPENSATE FOR TANK TEMPS & POSSIBLE HOT SPOTS.

EITHER APPROACH COULD BE ADVANTAGEOUS, COMPARED TO SIMPLE TEMPERATURE SENSORS, FOR ADJUSTING COOLANT FLOW RATES. IR ENERGY SHOULD RADIATE THROUGH THE OIL/COOLANT FROM HOT COMPONENTS BEFORE WARMER COOLANT CONVECTS OR IS FORCED TO TOP & TRIGGERED SIMPLE TEMP SENSOR.

Witnessed & Understood by me,

Date

Invented by:

CHAS BOYD

Date

5-27-2017

Recorded by:

CHAS BOYD

To Page No. _____

TITLE AIR CONTAINMENT SYSTEM

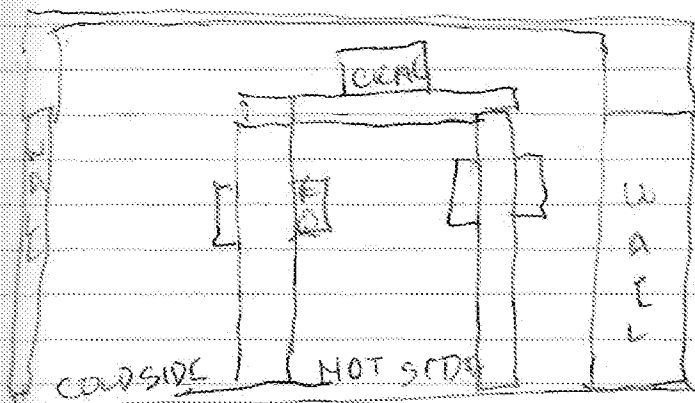
Project No. _____

Book No. _____

Form Page No. X

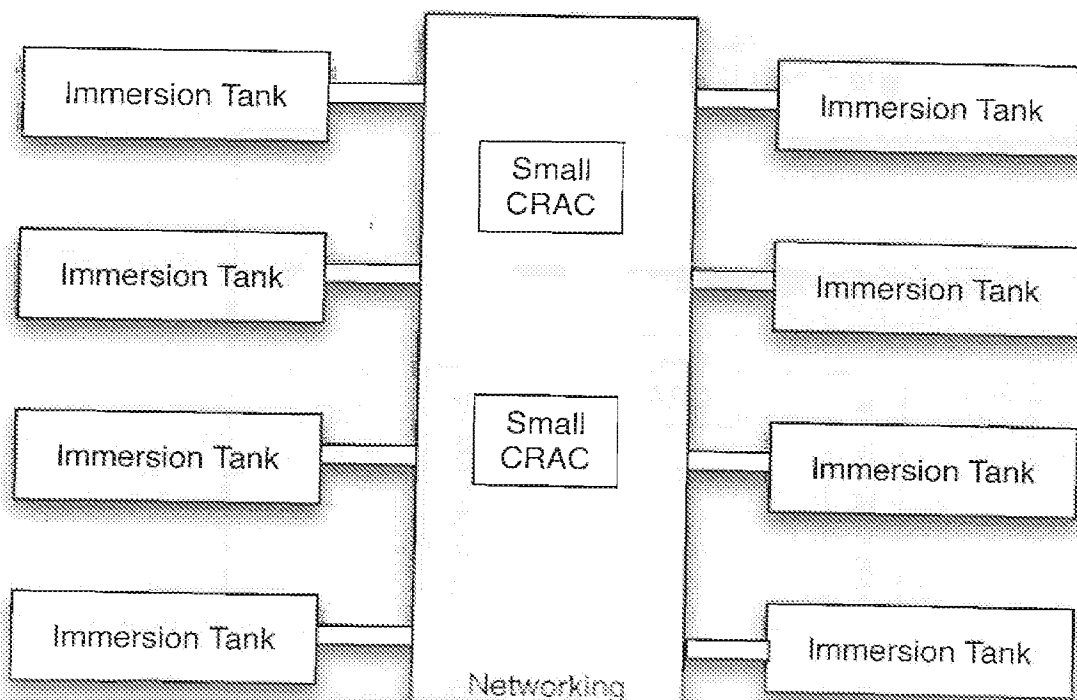
SINCE NOT ALL EQUIPMENT CAN BE IMMERSION COOLED,
WE NEED TO PROVIDE AN EFFICIENT METHOD TO COOL THIS GEAR.

USING A SYSTEM TO DO TOTAL CONTAINMENT OF HOT & COLD
AIR SHOULD PROVIDE AN ACCEPTABLY LOW PUE, EVEN
IN CASES WHERE NO OUTSIDE AIR CAN BE USED.

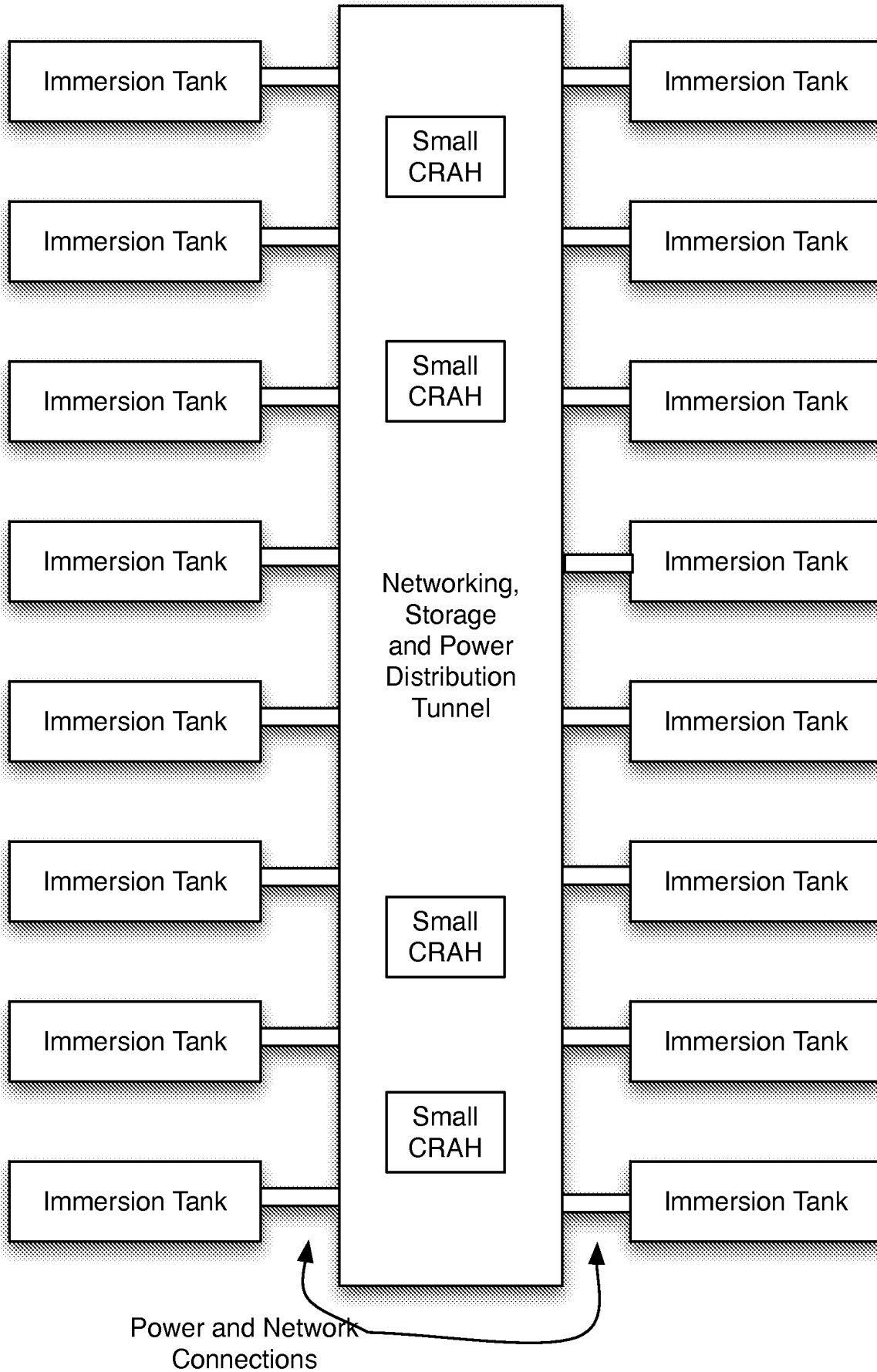


AIRFLOW → ← AIRFLOW

Top View

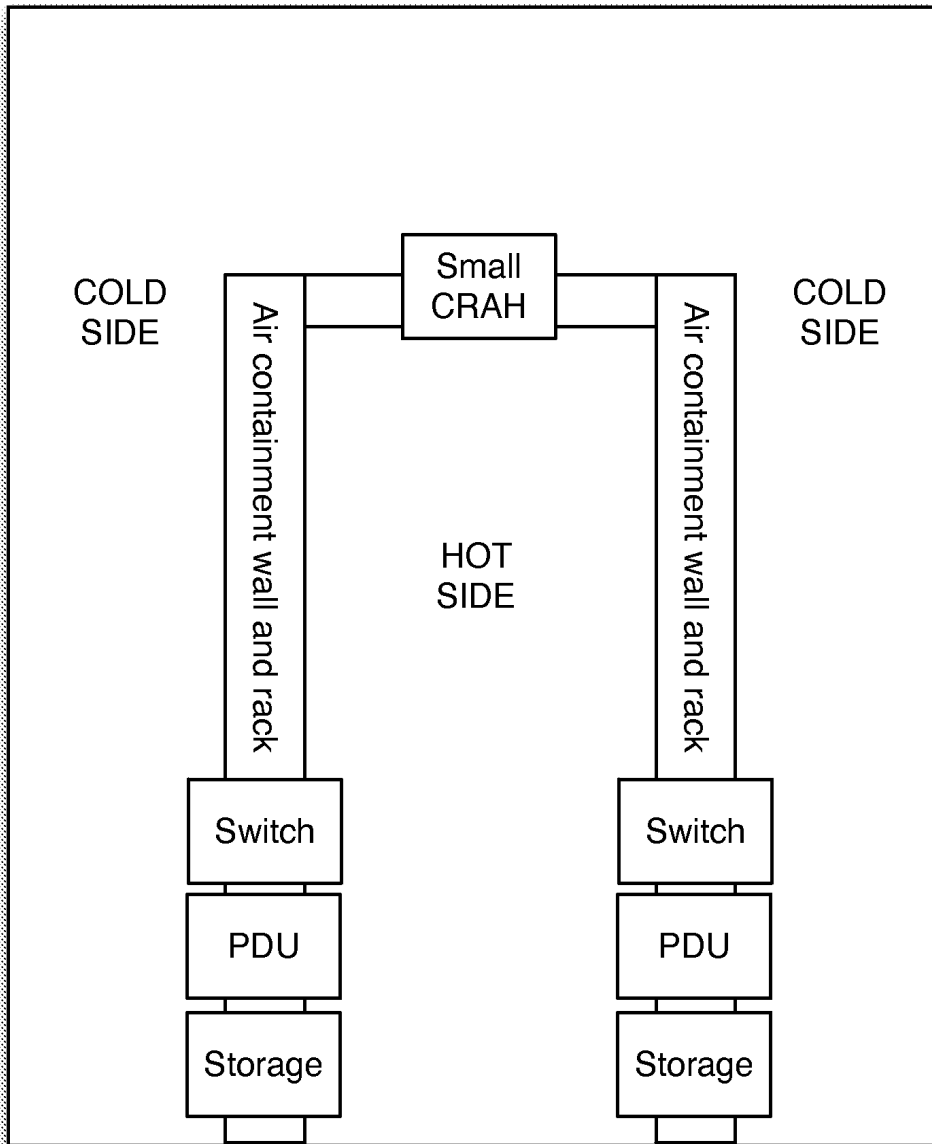


Top View



End View

Networking, Storage
and Power Distribution Tunnel



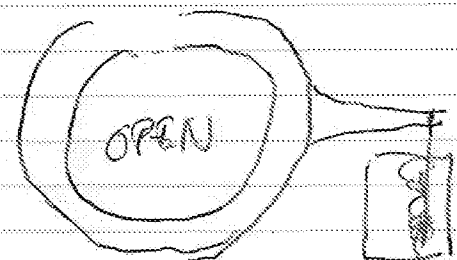
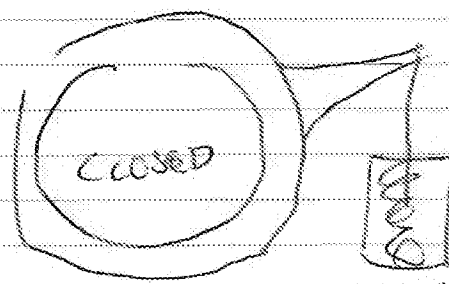
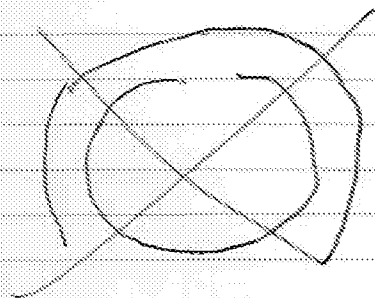
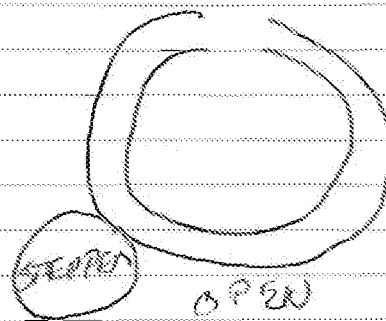
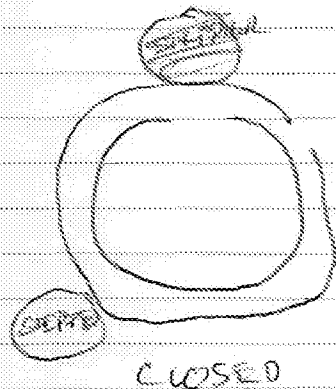
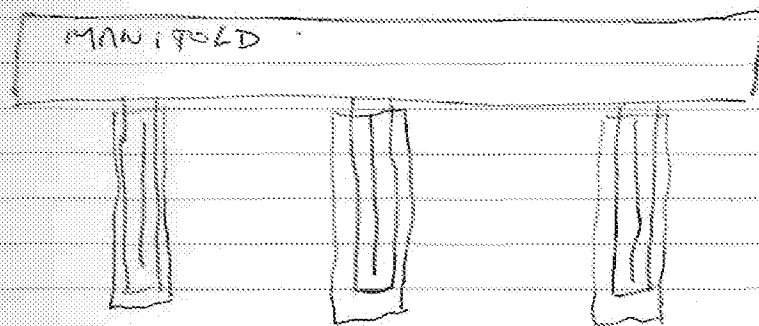
Project No. _____

Book No. _____

TITLE Flow Metering SystemPage No. X

One way to adjust coolant flow into tank -

Two tubes - one larger + one smaller, and sized such they fit one inside the other. Cut slots in each tube. Feed coolant into smaller tube, and rotate outer tube to expose wider or narrower slot for coolant to flow out of. Rotate tube with stepper or solenoid acting on arm attached to tube. Stepper probably best for digital control. Solenoid maybe best for analog control.



SOLENOID

To Page No. X

Designed & Understood by me,

Date

11-15-12

Invented by: CHRIS BOYD

Recorded by:

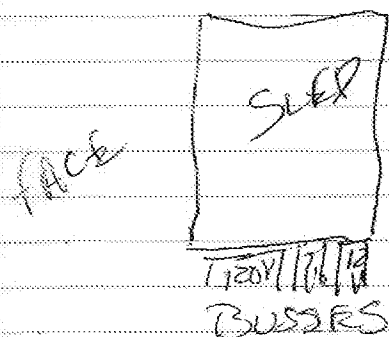
CHRIS BOYD

Date

10-18-2012

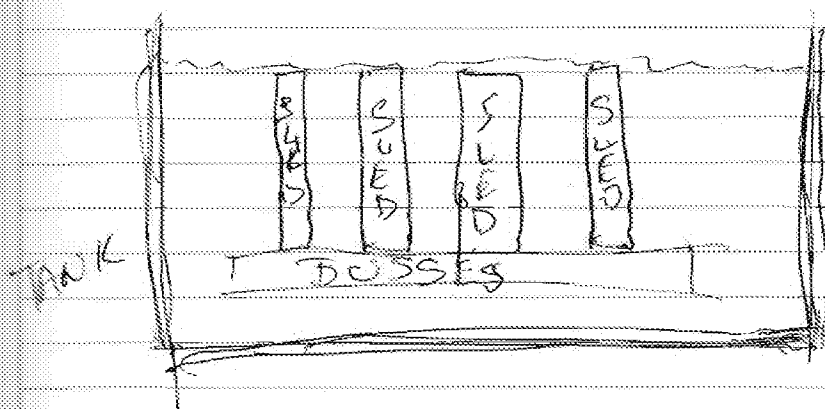
TITLE ENHANCED SLED

Book No. _____

From Page No. X

ALTERNATE MEANS OF POWER DISTRIBUTION TO SLEDs
 - INSTALL A POWER BUSS IN TRU TO DISTRIBUTE POWER TO SLED BOARDS.

SLEDs SNAP INTO POWER CONNECTOR TO DRAW 120VAC CONVENTIONAL PSC OR DIRECT 5VDC/12VDC POWER DIRECTLY TO THE MOTHERBOARD.



Witnessed & Understood by me:

Date

10-26-2012

Invented by:

Ken Tooke

Recorded by:

CHRIS BOYD

Date

10/26/

2012

To Page No. _____

Electronic Patent Application Fee Transmittal

| | | | | |
|---|------------------------------|-----------------|---------------|-----------------------------|
| Application Number: | | | | |
| Filing Date: | | | | |
| Title of Invention: | Server Immersion Tank System | | | |
| First Named Inventor/Applicant Name: | John H. Miller, Jr. | | | |
| Filer: | Jeffrey Van Myers | | | |
| Attorney Docket Number: | JMG001 | | | |
| Filed as Small Entity | | | | |
| Provisional Filing Fees | | | | |
| Description | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
| Basic Filing: | | | | |
| Provisional Application filing fee | 2005 | 1 | 125 | 125 |
| Pages: | | | | |
| Claims: | | | | |
| Miscellaneous-Filing: | | | | |
| Petition: | | | | |
| Patent-Appeals-and-Interference: | | | | |
| Post-Allowance-and-Post-Issuance: | | | | |
| Extension-of-Time: | | | | |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
|-------------------|----------|----------|--------|----------------------|
| Miscellaneous: | | | | |
| Total in USD (\$) | | | | 125 |

Electronic Acknowledgement Receipt

| | |
|---|------------------------------|
| EFS ID: | 14469753 |
| Application Number: | 61737200 |
| International Application Number: | |
| Confirmation Number: | 5753 |
| Title of Invention: | Server Immersion Tank System |
| First Named Inventor/Applicant Name: | John H. Miller, Jr. |
| Customer Number: | 44070 |
| Filer: | Jeffrey Van Myers |
| Filer Authorized By: | |
| Attorney Docket Number: | JMG001 |
| Receipt Date: | 14-DEC-2012 |
| Filing Date: | |
| Time Stamp: | 11:18:48 |
| Application Type: | Provisional |

Payment information:

| | |
|--|---------------------------|
| Submitted with Payment | yes |
| Payment Type | Electronic Funds Transfer |
| Payment was successfully received in RAM | \$ 125 |
| RAM confirmation Number | 9950 |
| Deposit Account | |
| Authorized User | |

File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|-----------------|----------------------|-----------|-------------------------------------|------------------|------------------|
|-----------------|----------------------|-----------|-------------------------------------|------------------|------------------|

| | | | | | |
|---|--------------------------------|-----------------------|---|----|----|
| 1 | Provisional Cover Sheet (SB16) | JMG001_PCS_121214.pdf | 2071456 77a542714667e6c884b56706e80f86e0da8db39c | no | 4 |
| Warnings: | | | | | |
| Information: | | | | | |
| 2 | Specification | JMG001_p_121214.pdf | 6854641 e2e8e7cf21f943b5db189d5445fc38c15c6cb78b | no | 38 |
| Warnings: | | | | | |
| The page size in the PDF is too large. The pages should be 8.5 x 11 or A4. If this PDF is submitted, the pages will be resized upon entry into the Image File Wrapper and may affect subsequent processing | | | | | |
| Information: | | | | | |
| 3 | Fee Worksheet (SB06) | fee-info.pdf | 28824 a86ba99a0a56136ee5d4490eb28a2ff65e04e7d | no | 2 |
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| Information: | | | | | |
| Total Files Size (in bytes): | | | 8954921 | | |
| <p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p> | | | | | |

DocCode - SCORE

SCORE Placeholder Sheet for IFW Content

Application Number: 61737200

Document Date: 12/14/2012

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

- Drawings – Other than Black and White Line Drawings

Since this was an electronic submission, there is no physical artifact folder, no artifact folder is recorded in PALM, and no paper documents or physical media exist. The TIFF images in the IFW record were created from the original documents that are stored in SCORE.

To access the documents in the SCORE database, refer to instructions developed by SIRA.

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- Other USPTO employees can bookmark the current SCORE URL (<http://es/ScoreAccessWeb/>).
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| APPLICATION NUMBER | FILING or 371(c) DATE | GRP ART UNIT | FIL FEE REC'D | ATTY. DOCKET NO | TOT CLAIMS | IND CLAIMS |
|-----------------------|--------------------------|-----------------|---------------|-----------------|------------|------------|
| 61/737,200 | 12/14/2012 | | 125 | JMG001-00 | | |

CONFIRMATION NO. 5753

44070

J. V. MYERS & ASSOCIATES, P.C.

P. O. BOX 130

DRIFTWOOD, TX 78619

FILING RECEIPT



OC000000058422461

Date Mailed: 01/04/2013

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If Required, Foreign Filing License Granted: 01/02/2013

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 61/737,200**

Projected Publication Date: None, application is not eligible for pre-grant publication

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

Server Immersion Tank System

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